ABSTRACT OF THE DISCLOSURE

Apparatus and methods for applying fasteners during endoscopic surgery. The apparatus generally comprises a handle portion, a triggering mechanism and a fastener applicator. One embodiment of the invention forms the fastener around a single focal point on an anvil. Another embodiment vertically stacks the fasteners in a fastener applicator which is readily detachable from the handle portion by virtue of a rotational locking system and which may be replaced with a new fastener applicator having a fresh load of vertically stacked fasteners. A third embodiment of the invention has a fastener applicator having only one actuated part in its. Application mechanism, and makes use of biased springs controlled by position of the actuated part for the remaining part of the mechanism. A fourth embodiment of the invention deploys a plunger/ratchet assembly and pawl within the handle portion of the apparatus to ensure that the apparatus application mechanism will not reverse in the middle of a triggered application stroke. The various embodiments may be variously combined together in a single device. The methods generally include the following steps: forming a fastener by placing it over a single focal point anvil, pressing the fastener against the single focal point anvil using a slide; discharging the fastener into the tissue of the patient. The method may be executed within the fastener applicator that is detachable from the handle portion. According to another method, the fastener is applied by the following steps: the fastener is moved from the storage channel, where it has been vertically stacked, to the driving channel by the biased fastener positioning spring as the slide is retracted; the slide is then advanced until the slide engages the fastener in the driving channel and drives the fastener over the anvil to form the fastener. During advancement of the slide the biased stop spring is forced back into a recess in the insert thereby allowing the next

fastener to move forward in the storage channel in response to the force of the biased pusher spring; the slide is then retracted, freeing the biased ejector springs to kick the formed fastener off the end of the anvil; finally the slide is further retracted, until the fastener positioning spring is once again free to move the distal-most fastener from the storage channel into the driving channel.